Inherent heterogeneity of sediments in Dhahran, Saudi Arabia-a case study

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Abstract: The behavior and properties of sediments depend on their compositional characteristics and formation processes, as well as the environmental conditions during their geological history, i.e. post-formation processes. A vertical cut made in a hill in Dhahran, Saudi Arabia, reveals a vivid picture of the inherent heterogeneity of sediments that have been deposited at different geological ages. A review of the geology of the area, as well as laboratory tests, help to determine the possible causes of the variability of soil types and properties in the area. Laboratory tests include basic geotechnical tests, chemical tests, X-ray diffraction analysis, scanning electron microscopy, and thermal analysis. These tests are used to identify different rock types and soils from the face of the cut. The results of this study indicate that the material from this cut varies from clayey shale and limestone rock (Tertiary, lower Eocene) formed some 52 M.Y. BP to calcite-cemented sand and pure calcite rock formed in the Quaternary age.